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Sequence Listing was accepted.

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217-9197 (toll free).

Reviewer: Anne Corrigan

Timestamp: [year=2008; month=2; day=12; hr=13; min=35; sec=34; ms=766; ]

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Application No: 10590441

Version No: 1.0

**Input Set:****Output Set:****Started:** 2008-02-12 11:18:30.460**Finished:** 2008-02-12 11:18:32.208**Elapsed:** 0 hr(s) 0 min(s) 1 sec(s) 748 ms**Total Warnings:** 26**Total Errors:** 0**No. of SeqIDs Defined:** 30**Actual SeqID Count:** 30

Error code	Error Description
W 213	Artificial or Unknown found in <213> in SEQ ID (5)
W 213	Artificial or Unknown found in <213> in SEQ ID (6)
W 213	Artificial or Unknown found in <213> in SEQ ID (7)
W 213	Artificial or Unknown found in <213> in SEQ ID (8)
W 213	Artificial or Unknown found in <213> in SEQ ID (9)
W 213	Artificial or Unknown found in <213> in SEQ ID (10)
W 213	Artificial or Unknown found in <213> in SEQ ID (11)
W 213	Artificial or Unknown found in <213> in SEQ ID (12)
W 213	Artificial or Unknown found in <213> in SEQ ID (13)
W 213	Artificial or Unknown found in <213> in SEQ ID (14)
W 213	Artificial or Unknown found in <213> in SEQ ID (15)
W 213	Artificial or Unknown found in <213> in SEQ ID (16)
W 213	Artificial or Unknown found in <213> in SEQ ID (17)
W 213	Artificial or Unknown found in <213> in SEQ ID (18)
W 213	Artificial or Unknown found in <213> in SEQ ID (19)
W 213	Artificial or Unknown found in <213> in SEQ ID (20)
W 213	Artificial or Unknown found in <213> in SEQ ID (21)
W 213	Artificial or Unknown found in <213> in SEQ ID (22)
W 213	Artificial or Unknown found in <213> in SEQ ID (23)
W 213	Artificial or Unknown found in <213> in SEQ ID (24)

**Input Set:**

**Output Set:**

**Started:** 2008-02-12 11:18:30.460  
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Error code

Error Description

This error has occurred more than 20 times, will not be displayed

# SEQUENCE LISTING

<110> JAPAN SCIENCE AND TECHNOLOGY AGENCY

<120> Highly efficient gene targeting

<130> RJ007P41

<140> 10590441

<141> 2008-02-12

<160> 30

<170> PatentIn version 3.1

<210> 1

<211> 609

<212> PRT

<213> Homo sapiens

<400> 1

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1 5 10 15

Glu Glu Glu Gln Glu Glu Asn Leu Glu Ala Ser Gly Asp Tyr Lys Tyr  
20 25 30

Ser Gly Arg Asp Ser Leu Ile Phe Leu Val Asp Ala Ser Lys Ala Met  
35 40 45

Phe Glu Ser Gln Ser Glu Asp Glu Leu Thr Pro Phe Asp Met Ser Ile  
50 55 60

Gln Cys Ile Gln Ser Val Tyr Ile Ser Lys Ile Ile Ser Ser Asp Arg  
65 70 75 80

Asp Leu Leu Ala Val Val Phe Tyr Gly Thr Glu Lys Asp Lys Asn Ser  
85 90 95

Val Asn Phe Lys Asn Ile Tyr Val Leu Gln Glu Leu Asp Asn Pro Gly  
100 105 110

Ala Lys Arg Ile Leu Glu Leu Asp Gln Phe Lys Gly Gln Gln Gly Gln  
115 120 125

Lys Arg Phe Gln Asp Met Met Gly His Gly Ser Asp Tyr Ser Leu Ser  
130 135 140

Glu Val Leu Trp Val Cys Ala Asn Leu Phe Ser Asp Val Gln Phe Lys			
145	150	155	160
Met Ser His Lys Arg Ile Met Leu Phe Thr Asn Glu Asp Asn Pro His			
	165	170	175
Gly Asn Asp Ser Ala Lys Ala Ser Arg Ala Arg Thr Lys Ala Gly Asp			
	180	185	190
Leu Arg Asp Thr Gly Ile Phe Leu Asp Leu Met His Leu Lys Lys Pro			
	195	200	205
Gly Gly Phe Asp Ile Ser Leu Phe Tyr Arg Asp Ile Ile Ser Ile Ala			
	210	215	220
Glu Asp Glu Asp Leu Arg Val His Phe Glu Glu Ser Ser Lys Leu Glu			
225	230	235	240
Asp Leu Leu Arg Lys Val Arg Ala Lys Glu Thr Arg Lys Arg Ala Leu			
	245	250	255
Ser Arg Leu Lys Leu Lys Leu Asn Lys Asp Ile Val Ile Ser Val Gly			
	260	265	270
Ile Tyr Asn Leu Val Gln Lys Ala Leu Lys Pro Pro Pro Ile Lys Leu			
	275	280	285
Tyr Arg Glu Thr Asn Glu Pro Val Lys Thr Lys Thr Arg Thr Phe Asn			
290	295	300	
Thr Ser Thr Gly Gly Leu Leu Leu Pro Ser Asp Thr Lys Arg Ser Gln			
305	310	315	320
Ile Tyr Gly Ser Arg Gln Ile Ile Leu Glu Lys Glu Glu Thr Glu Glu			
	325	330	335
Leu Lys Arg Phe Asp Asp Pro Gly Leu Met Leu Met Gly Phe Lys Pro			
	340	345	350
Leu Val Leu Leu Lys Lys His His Tyr Leu Arg Pro Ser Leu Phe Val			
	355	360	365

Tyr Pro Glu Glu Ser Leu Val Ile Gly Ser Ser Thr Leu Phe Ser Ala  
370 375 380

Leu Leu Ile Lys Cys Leu Glu Lys Glu Val Ala Ala Leu Cys Arg Tyr  
385 390 395 400

Thr Pro Arg Arg Asn Ile Pro Pro Tyr Phe Val Ala Leu Val Pro Gln  
405 410 415

Glu Glu Glu Leu Asp Asp Gln Lys Ile Gln Val Thr Pro Pro Gly Phe  
420 425 430

Gln Leu Val Phe Leu Pro Phe Ala Asp Asp Lys Arg Lys Met Pro Phe  
435 440 445

Thr Glu Lys Ile Met Ala Thr Pro Glu Gln Val Gly Lys Met Lys Ala  
450 455 460

Ile Val Glu Lys Leu Arg Phe Thr Tyr Arg Ser Asp Ser Phe Glu Asn  
465 470 475 480

Pro Val Leu Gln Gln His Phe Arg Asn Leu Glu Ala Leu Ala Leu Asp  
485 490 495

Leu Met Glu Pro Glu Gln Ala Val Asp Leu Thr Leu Pro Lys Val Glu  
500 505 510

Ala Met Asn Lys Arg Leu Gly Ser Leu Val Asp Glu Phe Lys Glu Leu  
515 520 525

Val Tyr Pro Pro Asp Tyr Asn Pro Glu Gly Lys Val Thr Lys Arg Lys  
530 535 540

His Asp Asn Glu Gly Ser Gly Ser Lys Arg Pro Lys Val Glu Tyr Ser  
545 550 555 560

Glu Glu Glu Leu Lys Thr His Ile Ser Lys Gly Thr Leu Gly Lys Phe  
565 570 575

Thr Val Pro Met Leu Lys Glu Ala Cys Arg Ala Tyr Gly Leu Lys Ser  
580 585 590

Gly Leu Lys Lys Gln Glu Leu Leu Glu Ala Leu Thr Lys His Phe Gln

595

600

605

Asp

&lt;210&gt; 2

&lt;211&gt; 732

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 2

Met Val Arg Ser Gly Asn Lys Ala Ala Val Val Leu Cys Met Asp Val  
 1 5 10 15

Gly Phe Thr Met Ser Asn Ser Ile Pro Gly Ile Glu Ser Pro Phe Glu  
 20 25 30

Gln Ala Lys Lys Val Ile Thr Met Phe Val Gln Arg Gln Val Phe Ala  
 35 40 45

Glu Asn Lys Asp Glu Ile Ala Leu Val Leu Phe Gly Thr Asp Gly Thr  
 50 55 60

Asp Asn Pro Leu Ser Gly Gly Asp Gln Tyr Gln Asn Ile Thr Val His  
 65 70 75 80

Arg His Leu Met Leu Pro Asp Phe Asp Leu Leu Glu Asp Ile Glu Ser  
 85 90 95

Lys Ile Gln Pro Gly Ser Gln Gln Ala Asp Phe Leu Asp Ala Leu Ile  
 100 105 110

Val Ser Met Asp Val Ile Gln His Glu Thr Ile Gly Lys Lys Phe Glu  
 115 120 125

Lys Arg His Ile Glu Ile Phe Thr Asp Leu Ser Ser Arg Phe Ser Lys  
 130 135 140

Ser Gln Leu Asp Ile Ile Ile His Ser Leu Lys Lys Cys Asp Ile Ser  
 145 150 155 160

Leu Gln Phe Phe Leu Pro Phe Ser Leu Gly Lys Glu Asp Gly Ser Gly  
 165 170 175

Asp Arg Gly Asp Gly Pro Phe Arg Leu Gly Gly His Gly Pro Ser Phe		
180	185	190
Pro Leu Lys Gly Ile Thr Glu Gln Gln Lys Glu Gly Leu Glu Ile Val		
195	200	205
Lys Met Val Met Ile Ser Leu Glu Gly Glu Asp Gly Leu Asp Glu Ile		
210	215	220
Tyr Ser Phe Ser Glu Ser Leu Arg Lys Leu Cys Val Phe Lys Lys Ile		
225	230	235 240
Glu Arg His Ser Ile His Trp Pro Cys Arg Leu Thr Ile Gly Ser Asn		
245	250	255
Leu Ser Ile Arg Ile Ala Ala Tyr Lys Ser Ile Leu Gln Glu Arg Val		
260	265	270
Lys Lys Thr Trp Thr Val Val Asp Ala Lys Thr Leu Lys Lys Glu Asp		
275	280	285
Ile Gln Lys Glu Thr Val Tyr Cys Leu Asn Asp Asp Asp Glu Thr Glu		
290	295	300
Val Leu Lys Glu Asp Ile Ile Gln Gly Phe Arg Tyr Gly Ser Asp Ile		
305	310	315 320
Val Pro Phe Ser Lys Val Asp Glu Glu Gln Met Lys Tyr Lys Ser Glu		
325	330	335
Gly Lys Cys Phe Ser Val Leu Gly Phe Cys Lys Ser Ser Gln Val Gln		
340	345	350
Arg Arg Phe Phe Met Gly Asn Gln Val Leu Lys Val Phe Ala Ala Arg		
355	360	365
Asp Asp Glu Ala Ala Ala Val Ala Leu Ser Ser Leu Ile His Ala Leu		
370	375	380
Asp Asp Leu Asp Met Val Ala Ile Val Arg Tyr Ala Tyr Asp Lys Arg		
385	390	395 400



Ala Asn Pro Gln Val Gly Val Ala Phe Pro His Ile Lys His Asn Tyr  
405 410 415

Glu Cys Leu Val Tyr Val Gln Leu Pro Phe Met Glu Asp Leu Arg Gln  
420 425 430

Tyr Met Phe Ser Ser Leu Lys Asn Ser Lys Lys Tyr Ala Pro Thr Glu  
435 440 445

Ala Gln Leu Asn Ala Val Asp Ala Leu Ile Asp Ser Met Ser Leu Ala  
450 455 460

Lys Lys Asp Glu Lys Thr Asp Thr Leu Glu Asp Leu Phe Pro Thr Thr  
465 470 475 480

Lys Ile Pro Asn Pro Arg Phe Gln Arg Leu Phe Gln Cys Leu Leu His  
485 490 495

Arg Ala Leu His Pro Arg Glu Pro Leu Pro Pro Ile Gln Gln His Ile  
500 505 510

Trp Asn Met Leu Asn Pro Pro Ala Glu Val Thr Thr Lys Ser Gln Ile  
515 520 525

Pro Leu Ser Lys Ile Lys Thr Leu Phe Pro Leu Ile Glu Ala Lys Lys  
530 535 540

Lys Asp Gln Val Thr Ala Gln Glu Ile Phe Gln Asp Asn His Glu Asp  
545 550 555 560

Gly Pro Thr Ala Lys Lys Leu Lys Thr Glu Gln Gly Gly Ala His Phe  
565 570 575

Ser Val Ser Ser Leu Ala Glu Gly Ser Val Thr Ser Val Gly Ser Val  
580 585 590

Asn Pro Ala Glu Asn Phe Arg Val Leu Val Lys Gln Lys Lys Ala Ser  
595 600 605

Phe Glu Glu Ala Ser Asn Gln Leu Ile Asn His Ile Glu Gln Phe Leu  
610 615 620

Asp Thr Asn Glu Thr Pro Tyr Phe Met Lys Ser Ile Asp Cys Ile Arg

625                      630                      635                      640

Ala Phe Arg Glu Glu Ala Ile Lys Phe Ser Glu Glu Gln Arg Phe Asn  
645 650 655

Asn Phe Leu Lys Ala Leu Gln Glu Lys Val Glu Ile Lys Gln Leu Asn  
660 665 670

His Phe Trp Glu Ile Val Val Gln Asp Gly Ile Thr Leu Ile Thr Lys  
675 680 685

Glu Glu Ala Ser Gly Ser Ser Val Thr Ala Glu Glu Ala Lys Lys Phe  
690 695 700

Leu Ala Pro Lys Asp Lys Pro Ser Gly Asp Thr Ala Ala Val Phe Glu  
705 710 715 720

Glu Gly Gly Asp Val Asp Asp Leu Leu Asp Met Ile  
725 730

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<211>	645
<212>	PRT
<213>	Neurospora crassa

<400> 3

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Asp Glu Glu Leu Asp Glu Asn Val Ser Tyr His Gln Ser Thr His Val  
20 25 30

Leu Phe Ala Ile Asp Val Ser Lys Ser Met Leu Lys Pro Pro Gln Asn  
35 40 45

Thr Gly Asp Lys Lys Ala Asp Lys Asp Ser Ala Leu Thr Ala Ala Leu  
50 55 60

Thr Cys Ala Tyr Gln Ile Met Gln Gln Arg Ile Ile Ser Gln Pro Lys  
65 70 75 80

Asp Met Met Gly Val Leu Leu Phe Gly Thr Glu Lys Ser Lys Phe Arg  
85 90 95

Asp	Asp	Ser	Gly	Asn	Gly	Thr	Gly	Tyr	Pro	His	Cys	Tyr	Leu	Leu	Ser	100	105	110
Asp	Leu	Asp	Ile	Pro	Gly	Ala	Glu	Asp	Val	Lys	Lys	Leu	Lys	Ala	Leu	115	120	125
Ile	Glu	Asp	Gly	Asp	Asp	Glu	Asp	Glu	Ile	Met	Val	Pro	Ser	Lys	Glu	130	135	140
Pro	Val	Ile	Met	Ser	Asn	Met	Leu	Phe	Cys	Ala	Asn	Gln	Val	Phe	Thr	145	150	155
Thr	Asn	Ala	Ala	Asn	Phe	Gly	Ser	Arg	Arg	Leu	Phe	Ile	Val	Thr	Asp	165	170	175
Asn	Asp	Asp	Pro	His	Ala	Gly	Asp	Lys	Gln	Ala	Lys	Ser	Ser	Ala	Ala	180	185	190
Val	Arg	Ala	Lys	Asp	Leu	Tyr	Asp	Leu	Gly	Val	Val	Ile	Glu	Leu	Phe	195	200	205
Pro	Ile	Ser	Arg	Glu	Asp	Lys	Lys	Phe	Asp	Leu	Ser	Lys	Phe	Tyr	Asp	210	215	220
Asp	Ile	Ile	Tyr	Arg	Asn	Pro	Ala	Ala	Glu	Ala	Gly	Gln	Ser	Glu	Ser	225	230	235
Pro	Lys	Thr	Ser	Lys	Ser	Gly	Asp	Gly	Leu	Thr	Leu	Leu	Asn	Ser	Leu	245	250	255
Ile	Ser	Asn	Ile	Asn	Ser	Lys	Gln	Thr	Pro	Lys	Arg	Ser	Tyr	Phe	Ser	260	265	270
Asn	Leu	Pro	Phe	Glu	Leu	Ala	Pro	Gly	Leu	Thr	Ile	Ser	Ile	Lys	Gly	275	280	285
Tyr	Met	Pro	Leu	Asn	Arg	Gln	Thr	Pro	Thr	Arg	Ser	Cys	Tyr	Val	Tyr	290	295	300
Glu	Gly	Glu	Glu	Gln	Ala	Gln	Val	Val	Gln	Ser	Glu	Thr	Ala	Gln	Val	305	310	315
																		320

Asp Phe Ala Ala Arg Thr Val Glu Lys Ser Glu Leu Arg Lys Gly Tyr  
325 330 335

Lys Phe Gly Gly Glu His Ile Cys Phe Lys Pro Glu Glu Leu Ala Glu  
340 345 350

Leu Lys Gln Met Gly Lys Lys Thr Leu Arg Ile Ile Gly Phe Lys Lys  
355 360 365

Arg Ser Lys Ile Pro Ser Trp Ala Ser Val Lys Lys Ser Ile Phe Ile  
370 375 380

Phe Pro Ser Glu Glu Gln Tyr Val Gly Ser Thr Arg Val Phe Ser Ala  
385 390 395 400

Leu Trp Gln Lys Leu Leu Lys Asp Asp Lys Val Gly Ile Ala Trp Phe  
405 410 415

Val Ala Arg Glu Asn Ala His Pro Val Met Val Ala Ile Phe Pro Ser  
420 425 430

Gly Asn Pro Asp Asp Glu Glu Ala Asn Thr Pro Tyr Leu Pro Ala Gly  
435 440 445

Leu Trp Leu Tyr Pro Leu Pro Phe Ala Asp Asp Val Arg Ser Val Asp  
450 455 460

His Val Thr Ala Pro Pro Arg Pro Ala Asp Glu Leu Thr Asp Gln Met  
465 470 475 480

Arg Gln Val Ile Gln Asn Leu Gln Leu Pro Lys Ala Met Tyr Asp Pro  
485 490 495

Arg Lys Tyr Pro Asn Pro Ser Leu Gln Trp His Tyr Lys Ile Leu Gln  
500 505 510

Ala Lys Ala Leu Asp Glu Glu Thr Pro Asp Ala Met Asp Asp Val Thr  
515 520 525

Leu Pro Lys Tyr Arg Gln Ile Asp Lys Arg Val Gly Gly Tyr Leu Ala  
530 535 540

Glu Trp Lys Glu Met Leu Ala Lys Lys Ala Asn Asp Leu Gln Asn Thr

545 550 555 560

Arg Ala Phe Lys Arg Glu Phe Glu Glu Asp Asp Glu Arg Pro Ala Lys  
565 570 575

Arg Ala Lys Pro Ser Lys Lys Ala Ala Ser Gly Gly Gly Gly Pro Ala  
580 585 590

Asn Ser Asn Ala Asp Leu Lys Lys Ala Phe Glu Gln Gly Thr Leu Gly  
595 600 605

Lys Met Thr Val Ala Glu Leu Lys Asp Ile Met Ala Ser Lys Gly Ile  
610 615 620

Ser Thr Ala Gly Arg Lys Ala Glu Leu Val Glu Arg Leu Glu Gln Trp  
625 630 635 640

Val Glu Glu Asn Leu  
645

<210> 4  
<211> 661  
<212> PRT  
<213> Neurospora crassa

<400> 4

Met Ala Asp Lys Glu Ala Thr Val Tyr Val Ile Asp Leu Gly Glu Ser  
1 5 10 15

Met Ala Asp Cys His Asn Gly Arg Asn Glu Ser Asp Leu Glu Phe Gly  
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